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Fontaine

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(54) **IDENTITY-BASED WIRELESS DEVICE CONFIGURATION**

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H04W 4/00 (2009.01)
H04M 1/66 (2006.01)
H04M 1/00 (2006.01)

(52) **U.S. Cl.** **370/338**; 370/328; 455/410; 455/432.3; 455/435.2; 455/560

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See application file for complete search history.

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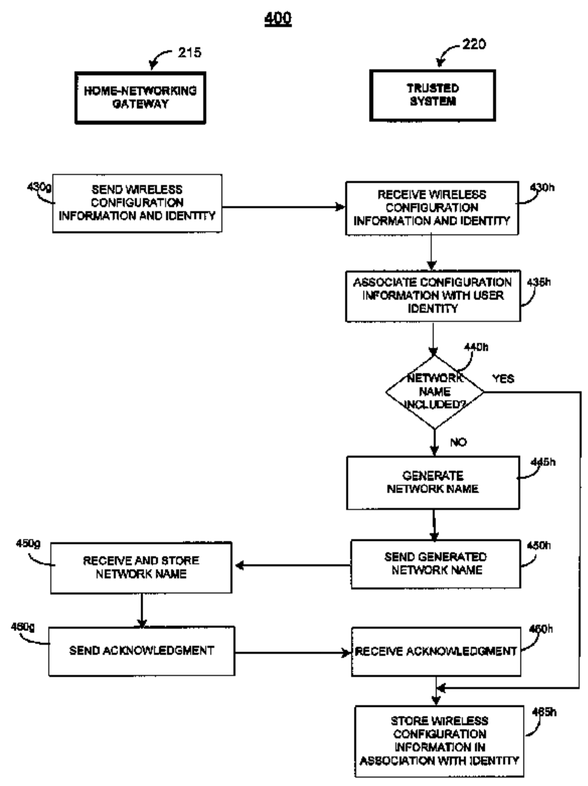
(57) **ABSTRACT**

Techniques are provided for the relating identity information with wireless configuration information for a wireless device or a wireless network. A trusted system may be used to generate wireless configuration parameters for a wireless network based on identity information. The identity-based wireless configuration information may be stored on the trusted system remote to the wireless network and accessible to the wireless device. The wireless configuration may be migrated from the trusted system to the wireless device.

27 Claims, 4 Drawing Sheets



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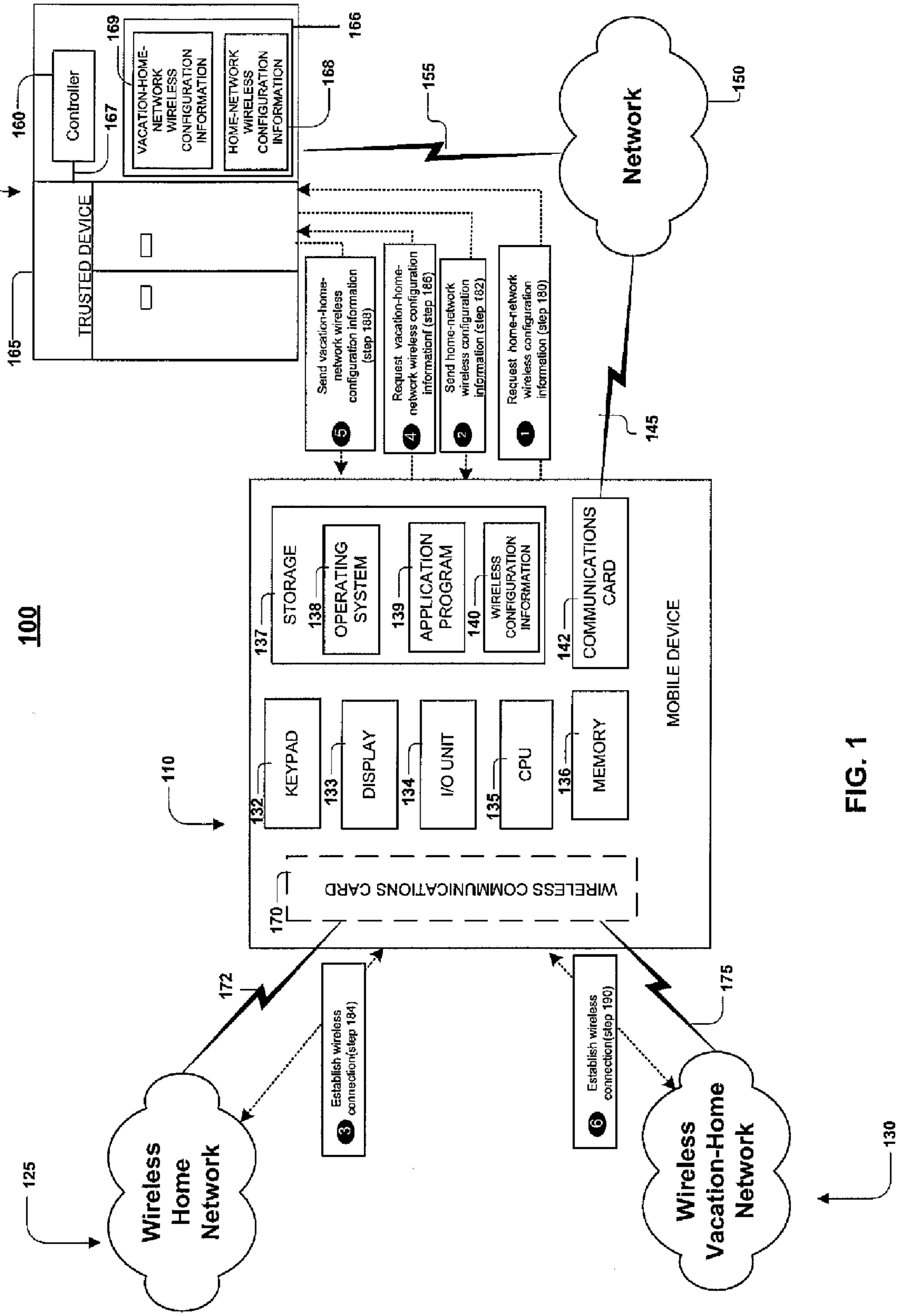

100
120
160
Controller
167
169
VACATION-HOME-NETWORK WIRELESS CONFIGURATION INFORMATION
166
168
HOME-NETWORK WIRELESS CONFIGURATION INFORMATION
155
Network
150
TRUSTED DEVICE
165
Send vacation-home-network wireless configuration information (step 188)
5
Request vacation-home-network wireless configuration information (step 186)
4
Send home-network wireless configuration information (step 182)
2
Request home-network wireless configuration information (step 180)
1
145
110
STORAGE
137
OPERATING SYSTEM
138
APPLICATION PROGRAM
139
WIRELESS CONFIGURATION INFORMATION
140
COMMUNICATIONS CARD
142
KEYPAD
132
DISPLAY
133
I/O UNIT
134
CPU
135
MEMORY
136
MOBILE DEVICE
WIRELESS COMMUNICATIONS CARD
170
172
Establish wireless connection(step 184)
3
Establish wireless connection(step 190)
6
175
125
Wireless Home Network
Wireless Vacation-Home Network
130

FIG. 1

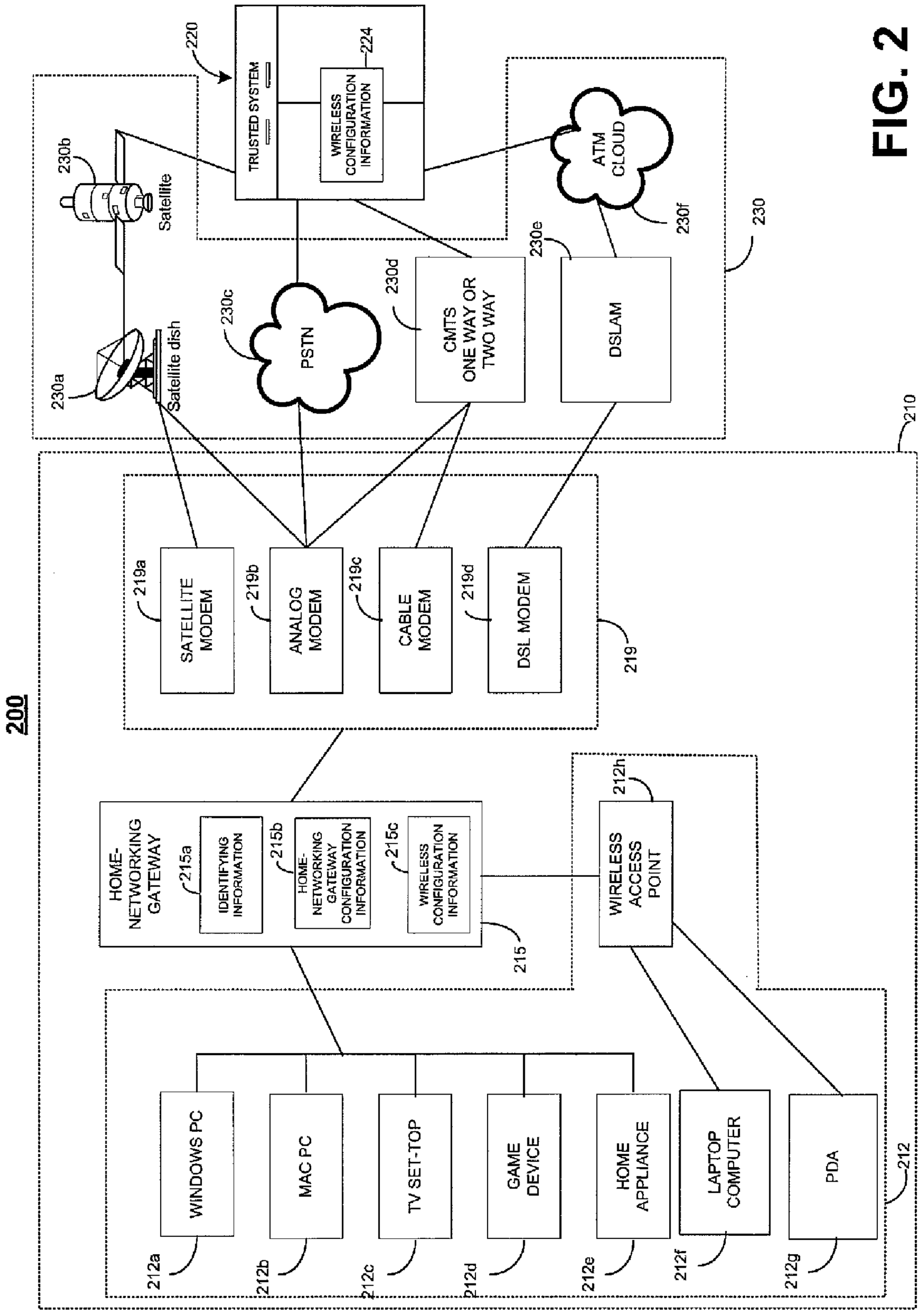

200
220
TRUSTED SYSTEM
224
WIRELESS CONFIGURATION INFORMATION
230
230b
Satellite
ATM CLOUD
230f
230e
230d
CMTS ONE WAY OR TWO WAY
DSLAM
230c
PSTN
230a
Satellite dish
210
219a
SATELLITE MODEM
219b
ANALOG MODEM
219c
CABLE MODEM
219d
DSL MODEM
219
HOME-NETWORKING GATEWAY
215a
IDENTIFYING INFORMATION
215b
HOME-NETWORKING GATEWAY CONFIGURATION INFORMATION
215c
WIRELESS CONFIGURATION INFORMATION
215
212h
WIRELESS ACCESS POINT
WINDOWS PC
MAC PC
TV SET-TOP
GAME DEVICE
HOME APPLIANCE
LAPTOP COMPUTER
PDA
212
212a
212b
212c
212d
212e
212f
212g

FIG. 2

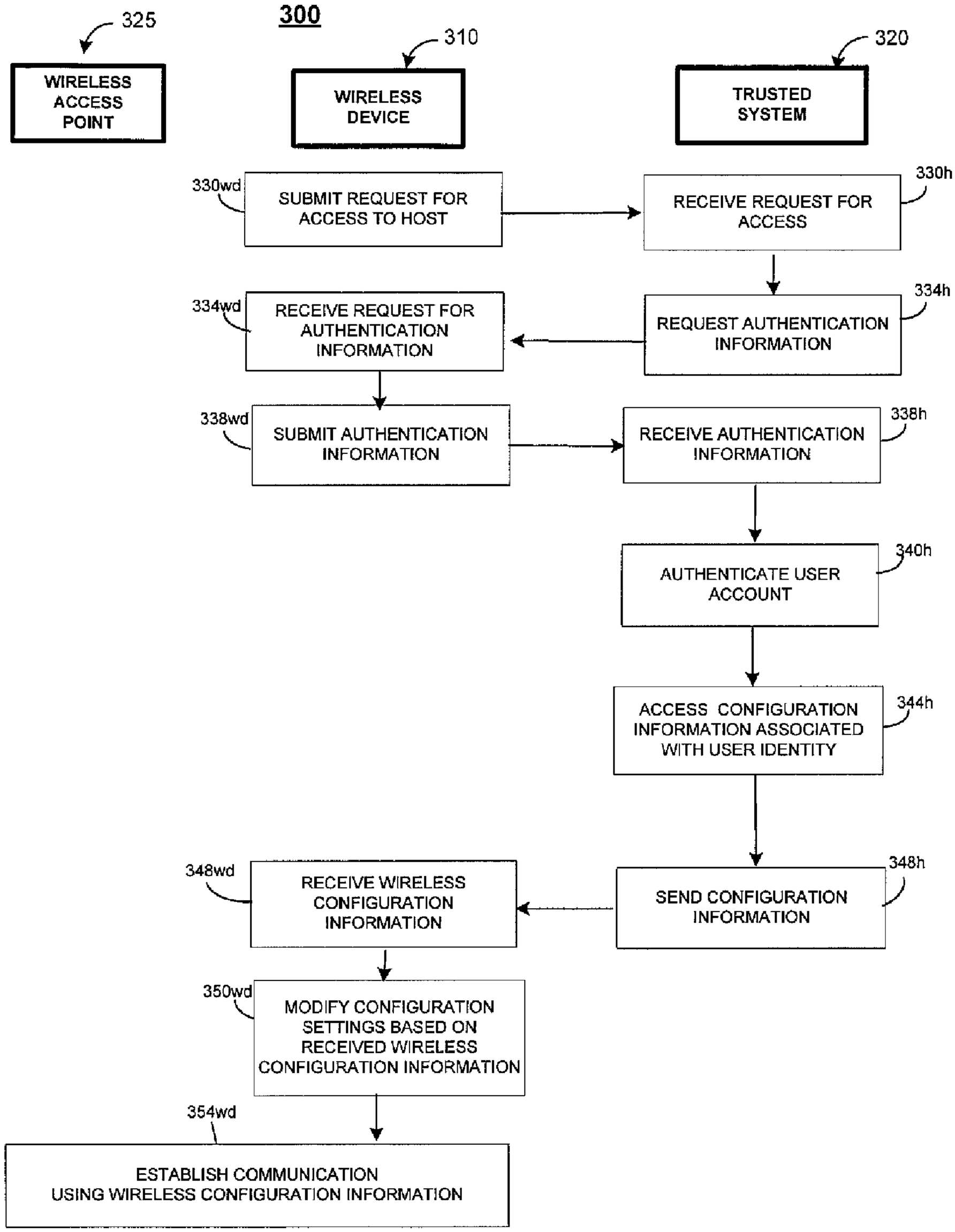

300
325
WIRELESS ACCESS POINT
310
WIRELESS DEVICE
320
TRUSTED SYSTEM
330wd
SUBMIT REQUEST FOR ACCESS TO HOST
330h
RECEIVE REQUEST FOR ACCESS
334h
REQUEST AUTHENTICATION INFORMATION
334wd
RECEIVE REQUEST FOR AUTHENTICATION INFORMATION
338wd
SUBMIT AUTHENTICATION INFORMATION
338h
RECEIVE AUTHENTICATION INFORMATION
340h
AUTHENTICATE USER ACCOUNT
344h
ACCESS CONFIGURATION INFORMATION ASSOCIATED WITH USER IDENTITY
348h
SEND CONFIGURATION INFORMATION
348wd
RECEIVE WIRELESS CONFIGURATION INFORMATION
350wd
MODIFY CONFIGURATION SETTINGS BASED ON RECEIVED WIRELESS CONFIGURATION INFORMATION
354wd
ESTABLISH COMMUNICATION USING WIRELESS CONFIGURATION INFORMATION

FIG. 3

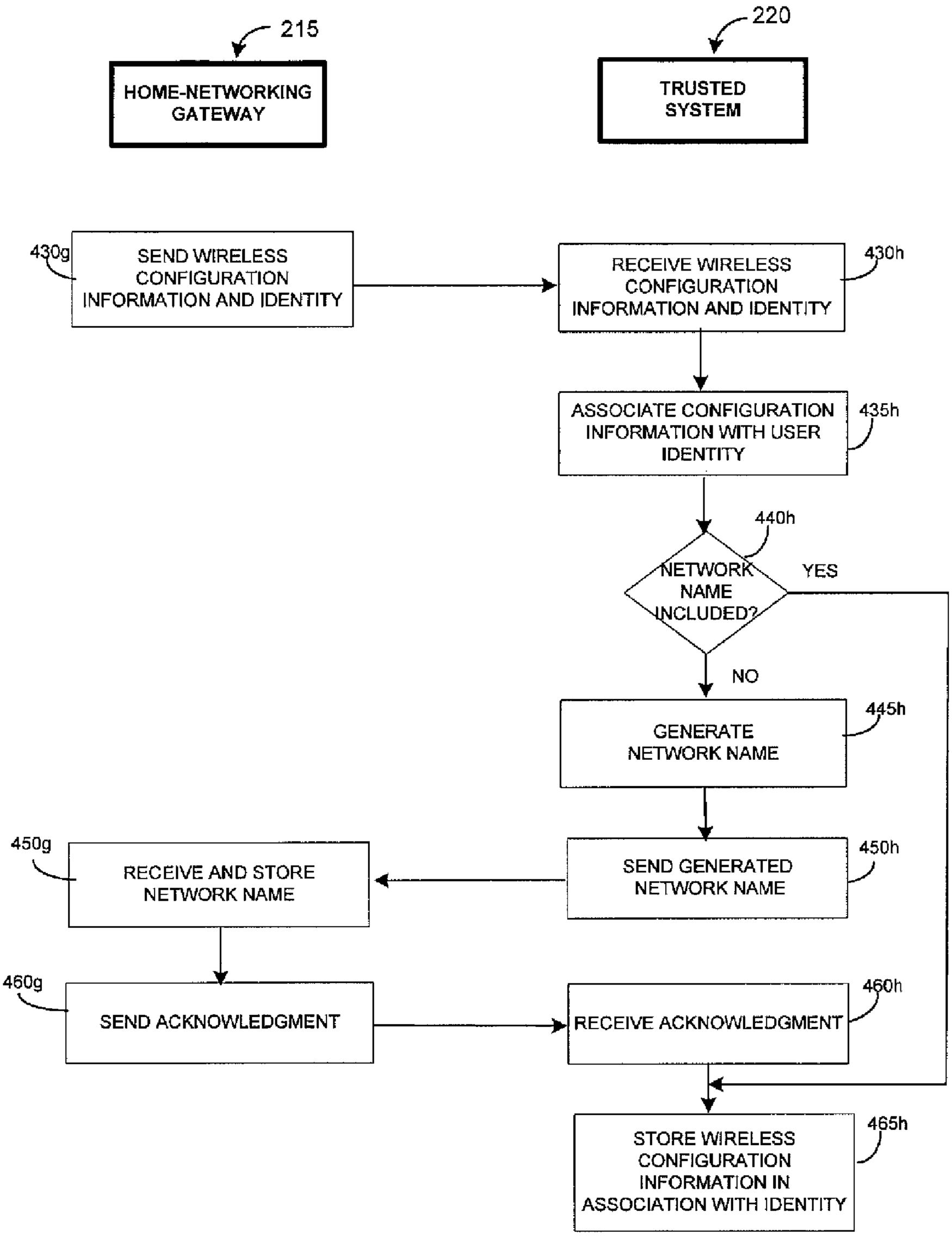

400
215
HOME-NETWORKING GATEWAY
220
TRUSTED SYSTEM
430g
SEND WIRELESS CONFIGURATION INFORMATION AND IDENTITY
430h
RECEIVE WIRELESS CONFIGURATION INFORMATION AND IDENTITY
435h
ASSOCIATE CONFIGURATION INFORMATION WITH USER IDENTITY
440h
NETWORK NAME INCLUDED?
YES
NO
445h
GENERATE NETWORK NAME
450g
RECEIVE AND STORE NETWORK NAME
450h
SEND GENERATED NETWORK NAME
460g
SEND ACKNOWLEDGMENT
460h
RECEIVE ACKNOWLEDGMENT
465h
STORE WIRELESS CONFIGURATION INFORMATION IN ASSOCIATION WITH IDENTITY

FIG. 4

IDENTITY-BASED WIRELESS DEVICE CONFIGURATION

CROSS-REFERENCE TO RELATED APPLICATIONS

This application is a continuation of U.S. application Ser. No. 10/448,326, filed May 30, 2003, the entire contents of which are incorporated by reference herein in their entirety.

TECHNICAL FIELD

This description relates to the configuration of a wireless device.

BACKGROUND

In a network of computing devices, a device on the network may be configured with particular information that enables communications with the other devices on the network. When a network includes wireless communications, the wireless devices and the wireless access points that connect the wireless devices to the network may be configured to communicate using a common set of wireless parameters or settings. This configuration process may require the entry of several sets of alphanumeric strings. To enable access by mobile wireless devices to two or more wireless networks, the wireless devices typically are configured to use wireless parameters appropriate for each of the networks.

SUMMARY

In one general aspect, configuring a wireless device includes obtaining an identity associated with a user of a device. Wireless configuration information based on the obtained identity is determined. The configuration of at least one of a wireless device and a wireless network based on the determined wireless configuration information is enabled.

Implementations may include one or more of the following features. For example, the device may be the same device as the wireless device, or may be a different device than the wireless device. The obtained identity associated with the user may be an identity associated with a user of a wireless device. Determining wireless configuration information may include accessing wireless configuration information based on the obtained identity. The user identity may be obtained from a storage location that is remote to the device used by the user. Wireless configuration information may be generated based on the obtained identity. A network identity may be generated. The obtained identity may be authenticated to determine whether the obtained identity is authorized to access a trusted system. Wireless configuration information may be generated and stored only when the received identity is authorized to access the trusted system. The generated wireless configuration information may be stored, and the generated wireless configuration may be stored at a storage location that is both remote to the wireless device and remote to a gateway associated with the wireless network.

Enabling configuration may include enabling the configuration of a wireless device for use with both the wireless network and the second wireless network. Enabling configuration also may include a wireless network with settings that are substantially the same as a second wireless network, and the second wireless network may be available for wireless connectivity concurrently with the wireless network for which configuration is enabled.

The trusted system may include a system provided by an Internet service provider or a system provided by an Internet access provider. The wireless configuration information may include a connectivity parameter. The identity may be a user identity or a network identity. The network identity may include one or more of a network name, a service set identifier, a media access control address, or a network address.

Generating wireless configuration information may include generating a network identity. A communications session between the wireless device and a trusted system may be established, as may a communications session between a gateway for the wireless network and the trusted system. The obtained wireless configuration information may be communicated between the wireless device and the trusted system.

In another general aspect, generating wireless configuration information includes identifying an identity associated with a device. The wireless configuration information is generated based on the identified identity. A wireless device is enabled to use the generated wireless configuration information.

Implementations may include one or more of the features noted above.

Implementations of the techniques discussed above may include a method or process, an apparatus or system, or computer software on a computer-accessible medium.

The details of one or more implementations set forth in the accompanying drawings and the description below. Other features will be apparent from the description and drawings, and from the claims.

DESCRIPTION OF DRAWINGS

FIGS. **1** and **2** are block diagrams illustrating exemplary communications systems capable of configuring devices used in a wireless network.

FIG. **3** is a block diagram illustrating exemplary communications between a wireless device, a wireless access point, and a trusted system to configure the wireless device.

FIG. **4** is a block diagram illustrating exemplary communications between a home-networking gateway and a trusted system to generate and store wireless configuration information.

DETAILED DESCRIPTION

Techniques are provided for configuring one or more wireless devices to use a wireless network. The wireless configuration information for a wireless network may be stored on a trusted system that is accessible to the wireless device. The wireless configuration information may be associated with a particular user identity. The wireless configuration then may be migrated from the trusted system to any wireless device when the wireless device accesses the trusted systems such that communications based on the migrated wireless configuration will be enabled by the accessing wireless device with or using the wireless network. The wireless device may be, for example, a wireless mobile device or a home-networking gateway capable of wireless communication. The trusted system is trusted by the wireless device and network, and the trusted system may be used to generate wireless configuration information, such as a network name, for the wireless network.

The techniques use an identity, such as a user name, as the basis for the configuration of a wireless network and wireless devices. Examples of an identity include a user name, a network identity, a street address of a user, or another type of information that may be used to generate a unique configu-

ration parameter. Wireless configuration information is stored at a trusted system to enable the configuration of wireless end-user devices seeking to communicate with the wireless network. The wireless configuration information stored at the trusted system also may enable the configuration of subsequent wireless networks with configuration settings that are the same or similar as an different wireless network. This may enable access by a mobile device, such as a PDA or laptop computer, to more than one currently existing wireless network without requiring the reconfiguration of the mobile device.

Referring to FIG. **1**, a communications system **100** is capable of delivering and exchanging data between a mobile device **110** and a trusted system **120**, a wireless home network **125**, or a wireless vacation-home network **130**. The mobile device **110** includes a keypad, a keyboard or another type of input device **132** (collectively, "keypad"), a display **133**, an I/O unit **134**, a central processing unit (CPU) **135**, a memory **136**, and a data storage device **137**. The data storage device **137** may store machine-executable instructions, data, and various computer programs, such as an operating system **138** and one or more application programs **139**, for implementing a process for configuring a wireless device, all of which may be processed by CPU **135**. Each computer program may be implemented in a high-level procedural or object-oriented programming language, or in assembly or machine language if desired. The language may be a compiled or interpreted language.

The data storage device **137** also may store wireless configuration information **140**. The wireless configuration information **140** may include protocol information necessary to configure the mobile device **110** to communicate with a wireless network, such as the wireless home network **125** or the wireless vacation-home network **130**. The wireless configuration information **140** stored on the mobile device **110** may include a wireless network name, such as a service set identifier (SSID), that identifies the particular network. The wireless configuration information **140** also may include security information, such as a cryptographic key that may be used to encrypt and decrypt transmitted data, a level of encryption (e.g., 40-bit encryption or 128-bit encryption) associated with a cryptographic key, or another type of security parameter that is specified by a security scheme. Examples of a security, scheme include (but are not limited to) wired equivalent privacy (WEP), WiFi Protected Access (WAP), and 802.11i. The storage of such wireless configuration information may be useful for the mobile device **110** that must maintain common configuration information with a wireless access point of the wireless home network **125** (or the wireless vacation-home network **130**) to enable communications with the wireless access point, and thus, the wireless home network **125** or the wireless vacation-home network **130**. For instance, the mobile device **110** and a wireless access point may be required to maintain the following configuration information in common to enable them to communicate: a cryptographic key, a SSID, a list of devices that are permitted access, and a level of encryption associated with the cryptographic key.

The data storage device **137** may be any form of non-volatile memory, including, for example, semiconductor memory devices, such as Erasable Programmable Read-Only Memory (EPROM), Electrically Erasable Programmable Read-Only Memory (EEPROM), and flash memory devices; magnetic disks, such as internal hard disks and removable disks; magneto-optical disks; and Compact Disc Read-Only Memory (CD-ROM).

The mobile device **110** also may include a communications card or device **142** (e.g., a modem and/or a network adapter) for exchanging data using a communications link **145** (e.g., a telephone line, a wireless network link, a wired network link, or a cable network) with a network **150**. Examples of the network **150** include the Internet, the World Wide Web, WANs, LANS, analog or digital wired and wireless telephone networks (e.g., ISDN ("Integrated Services Digital Network") and DSL ("Digital Subscriber Line"), including various forms of DSL such as SDSL ("Single-line Digital Subscriber Line"), ADSL ("Asymmetric Digital Subscriber Loop), HDSL ("High bit-rate Digital Subscriber Line"), and VDSL ("Very high bit-rate Digital Subscriber Line)), radio, television, cable, satellite, and/or any other delivery mechanism for carrying data.

The mobile device **110** may use communications links **145** and **155** and the network **150** to communicate with the trusted system **120**. As shown, the mobile communications device **110** may be, for example, a mobile telephone, a pager, a personal digital assistant ("PDA"), or a portable personal communicator.

The trusted system **120** is generally capable of executing instructions under the command of a trusted controller **160**. The trusted device **165** is connected to the trusted controller **160** by a wired or wireless data pathway **167** that is capable of delivering data.

The trusted device **165** and the trusted controller **160** each typically include one or more hardware components and software components. An example of a trusted device **165** is a general-purpose computer (e.g., a personal computer) capable of responding to and executing instructions in a defined manner. Other examples include a special-purpose computer, a workstation, a server, a device, a component, other physical or virtual equipment, or some combination thereof capable of responding to and executing instructions. The trusted device also may be a host system of an Internet access provider or an Internet service provider.

An example of a trusted controller **160** is a software application loaded on the trusted device **165** for commanding and directing communications enabled by trusted device **165**. Other examples include a program, a piece of code, an instruction, a device, a computer, a computer system, or a combination thereof, for independently or collectively instructing the trusted device **165** to interact and operate as described. The trusted controller **160** may be embodied permanently or temporarily in any type of machine, component, physical or virtual equipment, storage medium, or propagated signal capable of providing instructions to the trusted device **165**.

The trusted system **120** may store wireless configuration information **166**, including home-network wireless configuration information **168** and vacation-home network wireless configuration information **169**. The home network wireless configuration information **168** includes the wireless configuration information necessary to access the wireless home network **125**. Similarly, the vacation-home network wireless configuration information **169** includes the wireless configuration information necessary to access the wireless vacation-home network **130**. The home or vacation-home network wireless configuration information **168** or **169** may be associated with a user identity. Examples of a user identity include a user name, an account name, a supervisory account name, or another type of user identifier.

The mobile device **110** may use a wireless communications card **170** to communicate over wireless communications links **172** and **175** to the wireless home network **125** and the wireless vacation-home network **130**, respectively. When the trusted system **120** may be accessed wirelessly by the mobile device **110**, a single wireless communications card **170** may

function as communications card **145** and communications card **170**. To communicate with the wireless home network **125**, the wireless configuration information **140** on the mobile device **110** must be configured consistently with corresponding wireless configuration information on the wireless home network **125**. Similarly, to communicate with the wireless vacation-home network **130**, the wireless configuration information **140** must be configured consistently with wireless configuration information on the wireless home network **125**.

To establish wireless communication between the mobile device **110** and the wireless home network **125**, the mobile device **110** sends a request for home network wireless configuration information to the trusted system **120** using communications links **145** and **155** and the network **150** (step **180**). The request may include a user identity associated with the requested home network wireless configuration information.

The trusted system **120** accesses the stored home network wireless configuration information **168** based on the user identity included in the request (step **182**). The trusted system **165** then sends the accessed home network wireless configuration information **168** to the mobile device **110** using communications links **145** and **155** and the network **150**.

The mobile device **110** updates the wireless configuration information **140** with the received home network wireless configuration information (not shown). Using the updated wireless configuration information **140**, the mobile device **110** establishes a wireless connection **170** with the wireless home network **125** (step **184**).

Similarly, to establish wireless communication between the mobile device **110** and the wireless vacation-home network **130**, the mobile device **110** sends a request for vacation-home network wireless configuration information to the trusted system **120** using communications links **145** and **155** and the network **150** (step **186**). The request may include a user identity associated with the requested vacation-home network wireless configuration information.

The trusted system **120** accesses the stored vacation-home network wireless configuration information **169** based on the user identity included in the request, and sends the accessed information **169** to the mobile device **110** (step **188**).

The mobile device **110** updates the wireless configuration information **140** with the received vacation-home network wireless configuration information. Using the updated wireless configuration information **140**, the mobile device **110** establishes a wireless connection **175** with the wireless vacation-home network **130** (step **190**).

The trusted system **120** may be configured to use the user identity to generate a network name or network identifier for a wireless network, such as the wireless home network **125** or the wireless vacation-home network **130**. The automatic generation of a network name or network identifier based on a user identity may be advantageous. For example, the burden of the user of determining a suitable network name or network identifier may be reduced or eliminated. The generation of unique network names across multiple wireless networks operating in the same region, such as in a multi-dwelling unit environment, may be aided by the generation of a network name based on a identifier that is unique to a trusted system. This may be particularly true when many of the users of the multiple wireless networks operating in a region also are users of the same trusted system, as may be the case when the trusted system is a locally or nationally prominent Internet service or access provider.

One area where the techniques may find specific applicability is in the configuration of wireless devices, such as a mobile device or a gateway capable of wireless communication, to use the same wireless parameters for wireless networks in different locations. For example, a laptop computer may be configured to use wireless configuration parameters for a vacation-home wireless network based on the wireless configuration of the user's home network. For example, a user may have configured a vacation-home wireless network to operate with wireless configuration information stored on a trusted system. When the user visits or returns to the vacation-home with a laptop computer configured to operate on the user's home wireless network, they may wish to use the laptop computer with the vacation-home wireless network. If configuration information is not available at the user's laptop computer for accessing the vacation-home wireless network, the user may obtain such configuration information by establishing a wired connection (e.g., using a dial-up connection or a wired broadband connection) between the laptop computer and a trusted system, such as an Internet access provider or Internet service provider. The user accesses the trusted system using the laptop computer and connects to a wireless configuration service on the trusted system. For example, the user may select a function to download wireless home network parameters from a menu of services available from the trusted system. The trusted system identifies the appropriate wireless vacation-home network parameters for download based on the identity of the user. The wireless configuration parameters for the wireless vacation-home network are downloaded to the laptop computer from the trusted system, and the laptop computer is configured for use with the vacation-home wireless network. The user is then able to use the laptop computer to connect to the vacation-home wireless network.

In another example, a small business may have several offices and each office may be geographically dispersed from the other offices. Each office may include a wireless network that is separate from the other offices. The small business may wish to configure each of the wireless networks to use the same wireless configuration information. These techniques may permit the wireless networks to be configured using the same wireless configuration information when the wireless configuration is entered by a user only once. To accomplish this, wireless configuration information for a wireless network is stored on a trusted system. The wireless configuration information includes a network name based on unique identity information and generated by the trusted system. To configure a gateway for a second wireless network, a user accesses, on the trusted system, the wireless configuration information for the first wireless network that is associated with the user. The wireless configuration information on the trusted system is downloaded to the gateway for the second wireless network. The second wireless network is configured with the wireless configuration from the trusted system. Thus, a user with a laptop computer that is configured to operate on the wireless network at one office location also is able to access the wireless network at the second office location. This may be accomplished without requiring the user to reconfigure the wireless configuration information of the laptop computer and without requiring a user to enter wireless configuration information for the second wireless network.

Referring to FIG. **2**, a communications system **200** includes a home network **210** having multiple home-networked devices **212** connected to each other and to a home-networking gateway **215**. Some of the devices **212** are wireless devices. The home network **210** may be an example implementation of the wireless home network **125** of FIG. **1**.

The communications system **200** enables the devices **212** to communicate with a trusted system **220** through a home-networking gateway **215** using a single communication

device **219**. The devices **212**, the home-networking gateway **215**, and the communication device **219** may be included in a home network **210** physically located in a personal residence (e.g., a single-family dwelling, a house, a townhouse, an apartment, or a condominium). However, the location of the home-networking gateway **215** in the personal residence does not necessarily preclude one or more of the devices **212** from being networked to the home-networking gateway **215** from a remote location. Similarly, the location of the home-networking gateway in the personal residence does not necessarily preclude use of one or more of the devices **212** from outside of the personal residence or communication by those devices with the trusted system **220** through the home-networking gateway **215**. For instance, the devices **212** may include one or more portable computing devices that may be taken outside of the personal residence and still remain connected through a wireless access point to the home-networking gateway **215** located within the personal residence.

The home-networking gateway **215** is located logically between the devices **212** and a trusted system **220** that is external to the home network **210**. The trusted system **220** may be, for example, the trusted system **120** of FIG. **1**, an Internet access provider device, an Internet service provider device, an online trusted system proxy server, or another external system device.

The devices **212** may include one or more general-purpose computers (e.g., personal computers), one or more special-purpose computers (e.g., devices specifically programmed to communicate with the home-networking gateway **215** and/or the trusted system **220**), or a combination of one or more general-purpose computers and one or more special-purpose computers. Other examples of devices **212** include a workstation, a server, an appliance (e.g., a refrigerator, a microwave, or an oven), an intelligent household device (e.g., a thermostat, a security system, a heating, a ventilation and air conditioning (HVAC) system, or a stereo system), a device, a component, other physical or virtual equipment, or some combination of these elements capable of responding to and executing instructions in compliance with the system architecture.

As illustrated by FIG. **2**, examples of devices **212** may include, but are not limited to, a personal computer with a Windows™ OS **212***a*, a Macintosh™ personal computer **212***b*, a TV set-top box **212***c*, a game device **212***d*, a home appliance **212***e*, a laptop or otherwise portable computer **212***f*, a personal digital assistant (PDA) **212***g*, and a wireless access point (WAP) **212***h*. Some of the devices, such as a personal computer with Windows™ OS **212***a*, a Macintosh™ personal computer **212***b*, a TV set-top box **212***c*, a game device **212***d*, and a home appliance **212***e*, communicate with the home-networking gateway **215** through a wired network.

Some of the other devices, such as a laptop computer **212***f* and a PDA **212***g*, typically communicate with the home-networking gateway **215** using a wireless access point **212***h*. When devices communicate using wireless access point **212***h*, they may be referred to as wireless devices. Wireless devices maybe portable or fixed devices. For example, in another implementation, a desktop personal computer, such as a personal computer with a Windows™ OS **212***a* or a Macintosh™ personal computer **212***b*, may communicate using wireless access point **212***h*. Typically, the wireless access point **212***h* is connected to home-networking gateway **215** through the wired network, such that the wireless access point **212***h* transmits to the home-networking gateway **215** communications received over a wireless communications pathway from wireless devices. In another implementation, a wireless access point may be included in the home-networking gateway.

A wireless communications pathway may use various protocols to support communications between a wireless device and a wireless access point **212***h*. For example, the wireless communications pathway may use wireless technology based on the Institute of Electrical and Electronics Engineers, Inc. (IEEE) 802.11 standard (such as 802.11b, 802.11a or 802.11g). The wireless communications pathway also may use wireless technology based on the Bluetooth approach for short range wireless communications, other personal area network (PAN) technologies, or other wireless technology, such as the HiperLan2 standard by the European Telecommunications Standards Institute (ETSI).

Some of the devices **212**, such as a personal computer with Windows™ OS **212***a*, a Macintosh™ personal computer **212***b*, a laptop computer **212***f*, and a PDA **212***g*, include software for logging on to the trusted system **220** using a particular client application that is associated with, or that identifies, the user of the device. Such devices may be referred to as client devices. Other devices, such as home appliance **212***g*, may include software for logging on to trusted system **220** without identifying an associated user of the device. Yet other devices, such as TV set-top **212***c* and game device **212***d*, may be configured to function either as a client device or a non-client device depending on the function being performed.

FIG. **2** shows several implementations and possible combinations of devices and systems used within the home networking system **200**. For brevity, only a few illustrative elements are included in home networking system **200**.

The home-networking gateway **215** may include a home gateway device, such as a gateway, a router, or another communication device. The home-networking gateway **215** also may include a digital hub capable of receiving broadcast video signals, receiving communication data (such as through a broadband connection), and distributing the signals and data to devices **212**. The home-networking gateway **215** may include another communications device and/or a home entertainment device, such as a stereo system, a radio tuner, a TV tuner, a portable music player, a personal video recorder, and a gaming device. The home-networking gateway **215** may communicate with the trusted system **220** over communications links **230**, which generally are accessed using a communication device **219**.

Examples of the communication device **219** may include (but are not limited to) a satellite modem **219***a*, an analog modem **219***b*, a cable modem **219***c*, and a DSL modem **219***d*. The home-networking gateway **215** uses the communication device **219** to communicate with the trusted system **220** through communication links **230**.

The communication links **230** may include various types of communication delivery systems that correspond to the type of communication device **219** being used. For example, if the home-networking gateway **215** includes a satellite modem **219***a*, then the communications from a device **212** and an associated home-networking gateway **215** may be delivered to the trusted system **220** using a satellite dish **230***a* and a satellite **230***b*. The analog modem **219***b* may use one of several communications links **219**, such as the satellite dish **230***a* and satellite **230***b*, the Public Switched Telephone Network (PSTN) **230***c* (which also may be referred to as the Plain Old Telephone Service or POTS), and the Cable Modem Termination System (CMTS) **230***d*. The cable modem **219***c* typically uses the CMTS **230***d* to deliver and receive communications from the trusted system **220**. The DSL modem **219***d*

typically delivers and receives communications with the trusted system **220** through a Digital Subscriber Line Access Multiplexer (DSLAM) **230***e* and an Asynchronous Transfer Mode (ATM) network **230***f*.

The home networking system **200** may use various protocols to communicate between the devices **212** and the home-networking gateway **215** and between the home-networking gateway **215** and the trusted system **220**. For example, a first protocol may be used to communicate between the devices **212** and the home-networking gateway **215**, and a second protocol may be used to communicate between the home-networking gateway **215** and the trusted system **220**, where the first protocol and the second protocol may be the same or different protocols. As such, the home-networking gateway **215** may include different hardware and/or software modules to implement different home networking system protocols.

The home-networking gateway **215** may include identifying information **215***a*, such as a MAC ("Media Access Control") address and/or a network address, that may uniquely identify a home-networking gateway **215**. The identifying information **215***a* also may include an identifier or a name assigned by the trusted system **220**.

The home-networking gateway also may store home-network gateway configuration information **215***b* and wireless configuration information **215***c*. Home-networking gateway configuration information **215***b* may be stored in a table or a list on the home-networking gateway **215**. The configuration information **215***b* may be associated with identifying information **215***a* for the home-networking gateway **215** and/or a user account that is permitted access to the trusted system **220**.

The home-networking gateway configuration information **215***b* also may include device information for devices **212** associated with the home-network **210**. Device information may include a device identifier for a device, such as one of devices **212***a*-**212***h*. The device identifier may include a hardware device identifier, such as a MAC address, a unique serial number, and/or a network address, such as a static IP address associated with the device or a dynamic IP address. The dynamic IP address may be assigned by home-networking gateway **215**, by some other network device, or by the trusted system **220** through the Dynamic Host Configuration Protocol (DHCP) or another protocol that enables the dynamic allocation of an IP address to a device on a network.

The device information associated with each device also may include, for example, the type of device (e.g., a client or a non-client device), the class of device (e.g., a gaming device, a personal computer, or a PDA), the type of platform (e.g., the type of hardware, such as a Macintosh™ personal computer, a Windows™-based personal computer, a PDA, a home appliance, or an entertainment device), and/or the operating environment (e.g., the operating system type and/or version).

In addition, the device information may include a user-assigned name. The user-assigned name may be referred to as a familiar name or a nickname. For example, an identifier for a particular game device may be associated with the user-assigned name of "Billy's game device." The device information also may include parental control information or other types of access restrictions that are associated with the device.

The home-networking gateway configuration information **215***b* may include protocol information necessary to configure the home-networking gateway **215** to communicate with devices **212**, such as information describing how to establish communication with one or more of devices **212**, how to configure the wireless access point **212***h*, or how to configure wireless devices, such as the laptop computer **212***f* or the PDA **212***g*.

The wireless configuration information **215***c* may be stored in a table or a list on the home-networking gateway **215**. The wireless configuration information **215***c* may include security information, such as a cryptographic key and level of encryption, and a wireless network name, such as a service set identifier (SSID) that identifies the particular network. The wireless configuration information **215***c* may include a list of devices that are permitted access to the home network. For example, the wireless configuration information **215***c* may include a list of MAC addresses that uniquely identify the devices that are permitted access to the home network.

The storage of wireless configuration information **215***c* may be particularly useful for a wireless device, such as laptop computer **212***f* that must maintain common or at least consistent configuration information with a wireless access point to enable communications with the wireless access point. For instance, a wireless device and a wireless access point may be required to maintain/store the following configuration information in common to enable them to communicate: a cryptographic key, a SSID, a list of devices that are permitted access, and a level of encryption associated with the cryptographic key.

Additionally or alternatively, the home-networking gateway **215** may communicate with devices using only a wireless communications pathway. In other implementations, the home-networking gateway **215** may communicate with devices using only a wired communications pathway. Additionally or alternatively, the home-networking gateway **215** may include one or more communications devices **219** and/or one or more devices **212**.

The laptop computer **212***f* may connect to the trusted system **220** using, for example, an analog modem to communicate over the PSTN **230***c* or may connect to the trusted system **220** using the home-networking gateway **215**. The trusted system **220** sends wireless configuration information **224** to the laptop computer **112***f* to enable the laptop computer **212***f* to communicate with the home network **210** using the wireless access point **212***h*. The sending of wireless configuration information also may be referred to as migration of wireless configuration information.

The home-networking gateway **215** communicates the wireless configuration information **215***c* with the trusted system **220** using the communication device **219**. The trusted system **220** stores the received wireless configuration information **215***c* as configuration information **224**, and may associate the configuration information **224** with a particular user account or an unique identifier for an identity.

The ability of a trusted system **220** to store and communicate the wireless configuration information for a wireless network to a wireless device may be particularly useful in automating and/or simplifying the process used to configure a wireless device to work on a wireless network. By enabling a transfer of configuration information from the trusted system to the wireless device, configuration information may be transferred to different networking gateways and used to enable the different networking gateways and/or a wireless device or devices to be automatically configured for wireless communications. This may relieve a user of the burden of manually configuring the wireless device.

For example, a user may have a wireless network at the user's primary residence and a different wireless network at the user's vacation home. The user may wish to configure the vacation-home wireless network using the wireless configuration information for the user's primary-residence home

network. To do so, the wireless configuration information for the primary-residence home wireless network may be stored on the trusted system and communicated to the vacation-home wireless network. For example, the user may send the wireless configuration from the home-networking gateway of the primary-residence home network to the trusted system. Subsequently, the user may retrieve the wireless configuration from the trusted system to configure the vacation-home wireless network. The user may retrieve the wireless configuration information from the trusted system, for example, by using a wired connection between the home-networking gateway on the vacation-home wireless network and the trusted system. This may occur without requiring user manipulation. For example, when a user accesses the trusted system using a computer connected through a home-networking gateway at the vacation-home, the trusted system may send the wireless configuration information associated with the primary residence home-networking gateway to the home-networking gateway at the vacation home, and, thus, enable access to the wireless network by a wireless device configured for use with the wireless network at the primary residence. Alternatively, the user who wishes to access the vacation-home wireless network may retrieve the wireless configuration information from the trusted system by using a mobile computer to connect with the trusted system, for example, as described previously with the respect to FIG. **1**. The retrieved wireless configuration information then is used to configure the vacation-home wireless network.

The ability to replicate wireless configuration information from one wireless network to a different wireless network may relieve a user from the burden of entering wireless configuration information for the wireless network. This may be particularly advantageous when the wireless configuration information to be entered is cumbersome, such as when several sets of alphanumeric strings are required.

The trusted system **220** may be configured to generate a network name, such as a SSID, to enable wireless devices to interconnect using the wireless network. The trusted system **220** generates a network name based on a user identity in response to a request sent from the home-networking gateway **215**. The identity used in the generation of the network name may be a user identity that is authorized to access the trusted system **220**. For example, the user identity may include a user name or an account name that is associated with the home-networking gateway **215**. The user identity also may include a user name or an account name associated with one of the devices **212** that is connected to the trusted system **220** through the home-networking gateway **215**.

The generation of a network name or another type of wireless connectivity parameter based on a user identity may be beneficial. For example, the generation of a network name on a user account name may simplify the discovery and registering of wireless networks and wireless devices. Furthermore, using a trusted system to generate a network name based on a user identity may be particularly advantageous, relieving a user of performing the burdensome process of identifying and remembering an appropriate network name. The use of a trusted system also may provide an increased level of security for the wireless network by generating a network name based on an authenticated user identity. In some cases, a user may be discouraged by the prospect of generating a memorable, unique network name and may therefore avoid modifying a default network name for a gateway provided by the manufacturer. The user's continued use of default wireless configuration information may reduce the security provided by the wireless network because the default wireless configuration information may be generally known, such as when a manufacturer uses the same default network name for all devices that the manufacturer sells. The ability of a trusted system to generate a network name based on user identity information may encourage a user to modify the default network name when the user otherwise would not do so.

FIG. **3** shows an exemplary process **300** that configures a wireless device **310** to communicate with a wireless network using wireless configuration information retrieved from a trusted system **320**. The wireless configuration information may be retrieved from storage on the trusted system **320**, where the wireless configuration information is associated with a user identity and enables wireless communication with wireless access point **325**.

The wireless device **310** may be, for example, a laptop computer **212***f* or a PDA **212***g* described previously with respect to FIG. **2**. The trusted system **320** may be an implementation of the trusted system **120** of FIG. **1** or the trusted system **220** of FIG. **2**. The wireless access point **325** may be an implementation of the wireless access point **212***h* of FIG. **2** or a home-networking gateway that includes a wireless access point. In some implementations, a wireless access point, a wireless device, or another type of device may perform the roles described as being associated with the wireless access point **325**.

The process **300** begins when the wireless device **310** submits a request for access to the trusted system **320** (step **330***wd*). The wireless device **310** submits the request for access to the trusted system using a wired or wireless network other than the network for which the wireless device **310** is being configured. For example, referring to FIG. **1**, a wireless mobile device **110** may use network **150** to access the trusted system **120** to configure the wireless mobile device **110** to communicate using the wireless home network **125** or the wireless vacation-home network **130**.

The trusted system **320** receives the request for access (step **330***h*) and requests authentication information (step **334***h*).

The wireless device **310** receives the request for authentication information (step **334***wd*) and submits authentication information (step **338***wd*). For example, the wireless device **310** may submit a user or screen name and a password or other authenticating information.

The trusted system **320** receives the authentication information (step **338***h*) and authenticates the user account of the wireless device **310** (step **340***h*). If the trusted system **320** determines that the user account associated with the wireless device **310** is not authenticated, the trusted system may take any of several actions (not shown), including terminating the session immediately, sending a message to the wireless device **310**, or sending a message to a master, family or supervisory account associated with the home-networking gateway **315**.

When the trusted system **320** determines that the user associated with the wireless device **310** is an authenticated user, the trusted system **320** accesses wireless configuration information (step **344***h*). For example, the trusted system **320** may access wireless configuration information **324**, as described previously with respect to the trusted system **320** of FIG. **3**. The accessed wireless configuration information may include, for example, a cryptographic key, a network name (such as a SSID), a list of devices permitted to access the network, and other information needed to configure the device to work on the wireless home network, examples of which are described with respect to FIG. **1**. When more than one set of wireless configuration information is associated with an identity, the trusted system **320** may present a list of a portion of the sets of wireless configuration information (e.g., such as a network name) and may await for a selection

of one of the wireless configuration information sets by the user. Alternatively, the trusted system **320** may present one of several sets of wireless configuration information based on, for example, a priority associated with each set of wireless configuration information, a frequency of access of each set of wireless configuration information, or another type of wireless configuration information characteristic; the trusted system **320** then obtains user confirmation that the presented set of wireless configuration information is the desired wireless configuration information.

The trusted system **320** sends the accessed wireless configuration information to the wireless device (step **348***h*).

The wireless device **310** receives the wireless configuration information (step **348***wd*) and modifies the configuration information previously stored by the wireless device (step **350***wd*), if necessary and to the extent that such wireless configuration information exists. For example, the wireless device **310** may update a configuration table (or otherwise modify the configuration parameters) with the wireless configuration information received. In some implementations, the wireless device **310** may pull information from the trusted system **320** in addition to or in lieu of the trusted system **320** sending the wireless configuration information in step **348***h*.

When the wireless device **310** modifies the wireless configuration settings, the wireless device **310** then maybe capable of establishing communications with the wireless access point **325** (and, hence, the wireless network served by the wireless access point **325**) using the received wireless configuration information (step **354***wd*).

Alternatively, after the trusted system **320** obtains an identifier associated with the user of the wireless device **310** and accesses wireless configuration information based on the obtained identifier, the trusted system **320** may coordinate or otherwise enable the configuration of the wireless device, the wireless access point **325**, and/or other components of the wireless network served by the wireless access point **325** based on the accessed wireless configuration information.

Using the structure and organization shown by FIG. **2**, FIG. **4** depicts a process **400** for communicating between a home-networking gateway **215** and a trusted system **220** to generate and store wireless configuration information. If required during process **400**, the trusted system **220** generates a network name.

The process **400** begins when the home-networking gateway **215** sends wireless configuration information and an identity to the trusted system **220** (step **430***g*). The identity may be, for example, a user identity that identifies a user, such as a user name, an account name, a subscriber name, or a master or family account name. The identity also may be a network identifier, such as a SSID. To send wireless configuration information and an identity to the trusted system, the home-networking gateway **215** may access stored wireless configuration information, as described previously with respect to FIG. **2**. The wireless configuration information may include, for example, a cryptographic key, a network name (such as a SSE)), a list of devices permitted to access the network, and other information needed to configure a device to work on the wireless home network.

Alternatively, the home-networking gateway **215** may not include a network name in the wireless configuration information sent to the trusted system **220**. This may occur, for example, when the wireless network has not itself been completely installed or configured, and no network name has been assigned to the wireless network. In such a case, the process **400** includes the generation of a network name based on the identity sent, as described later.

The user identity, for example, may be a user name associated with a user account used to establish a connection between the home-networking gateway **215** and the trusted system **220**. Alternatively, the user identity may be a user name that is associated with a device capable of accessing the trusted system **220** using the home-networking gateway.

In some implementations, the user identity may be a user identity that is not associated either with the trusted system **220** or with the home-networking gateway **215**. In yet other implementations, a user identity may be selected from among a list of possible user identities. In some implementations, a user identity is not provided at all. Instead, the trusted system **220** uses a user identity that is not provided by the home-networking gateway.

The trusted system **220** receives the wireless configuration information and the user identity (step **430***h*) and associates wireless configuration information with the received user identity. The trusted system **220** may associate the wireless configuration information with a user identity by storing both an identifier for the wireless configuration information and the user or network identity in a table, a list or another type of data structure. Alternatively, the trusted system **220** may associate the wireless configuration information with a user identity by storing both the wireless configuration information and the user, or network, identity in a table, a list, or another type of data structure.

The trusted system **220** determines whether the received wireless configuration information includes a network name, such as an SSID (step **440***h*). If not, the trusted system **220** generates a network name (step **445***h*). This may be accomplished, for example, by generating a network name that is based on the user identity associated with the received wireless configuration information. In some implementations, the trusted system **220** authenticates the received user identity and only generates a network name when an authenticated user identity has been received.

When the trusted system **220** generates a network name (step **345***h*), the trusted system sends the generated network name to the home-networking gateway **215** (step **450***h*). The home-networking gateway **215** receives and stores the network name (step **450***g*). In some implementations, the trusted system **220** may send to the home-networking gateway **215** the received wireless configuration information in addition to the network name.

The home-networking gateway **215** may store the network name in a configuration table (or otherwise modify the configuration parameters) with the received network name.

The home-networking gateway **215** sends to the trusted system **220** an acknowledgment that the network name has been received (step **460***g*). The trusted system **220** receives the acknowledgment (step **460***h*). When the home-networking gateway **215** does not receive an acknowledgment, the home-networking gateway **215** may take one of several actions, such as re-sending the network name to the wireless device **410** or sending an electronic mail message to a user account to notify the user that an acknowledgment was not received. In some implementations, the home-networking gateway **215** may receive or pull information from the trusted system **420** in addition to or in lieu of the trusted system **220** sending the network name in step **450***g*.

When the trusted system **220** receives an acknowledgment from the home-networking gateway **215**, the trusted system stores the wireless configuration information in association with the identity (step **465***h*).

The techniques and concepts are applicable to home network devices other than a home-networking gateway. For example, a router, a digital hub, a general-purpose computer,

or a single-purpose configuration management device may perform the functions described as being performed by the home-networking gateway.

Implementations may include a method or process, an apparatus or system, or computer software on a computer medium. It will be understood that various modifications may be made that still fall within the following claims. For example, advantageous results still could be achieved if steps of the disclosed techniques were performed in a different order and/or if components in the disclosed systems were combined in a different manner and/or replaced or supplemented by other components.

Although the techniques and concepts have been described in which a trusted system stores configuration information and performs a proxy configuration service for a wireless device, a wireless access point, or a home-networking gateway, a trusted system that may not necessarily be in a host-client relationship with the home-networking gateway may be used in place of the described trusted system. Another type of trusted computing device also may be used to perform the described techniques and concepts. For example, a general-purpose computer accessible to the network, such as in a peer-to-peer relationship, or another trusted computer system may be used to perform the functions described as being performed by the trusted system.

Furthermore, although the techniques and concepts have been described in which an identity is associate with a user account that is authenticated and associated with information for a home-networking gateway or other communication device, the user account does not necessarily need to be a subscriber account. The techniques and concepts described with respect to a user account are applicable to a user identity or an user operating a device or a home-networking gateway.

What is claimed is:

1. A method for communicating wireless configuration information for a wireless network to a wireless device, the method comprising:

storing, on a trusted system, a collection of wireless network configuration information for different wireless networks, the collection of wireless network configuration information including:

first wireless network configuration information that corresponds to a first wireless network and that is useful for configuring devices to enable the devices to communicate wirelessly over the first wireless network, and

second wireless network configuration information that corresponds to a second wireless network and that is useful for configuring the devices to enable the devices to communicate wirelessly over the second wireless network;

storing, on the trusted system, an association between a first user identity and the first wireless network configuration information;

storing, on the trusted system, an association between a second user identity and the second wireless network configuration information;

receiving a first communication that is associated with the first user identity;

accessing, in response to receipt of the first communication and from storage on the trusted system, associations between wireless network configuration information and user identities, the accessed associations between wireless network configuration information and user identities including the stored association between the first user identity and the first wireless network configuration information and the stored association between the second user identity and the second wireless network configuration information;

determining that the first user identity is associated with the first communication;

based on determining that the first user identity is associated with the first communication and by leveraging the accessed association between the first user identity and the first wireless network configuration information, identifying and communicating the first wireless network configuration information to a first wireless device;

receiving a second communication that is associated with the second user identity;

accessing, in response to receipt of the second communication and from storage on the trusted system, associations between wireless network configuration information and user identities, the accessed associations between wireless network configuration information and user identities including the stored association between the first user identity and the first wireless network configuration information and the stored association between the second user identity and the second wireless network configuration information;

determining that the second user identity is associated with the second communication; and

based on determining that the second user identity is associated with the second communication and by leveraging the accessed association between the second user identity and the second wireless network configuration information, identifying and communicating the second wireless network configuration information to a second wireless device.

2. The method of claim **1** wherein receiving a first communication that is associated with the first user identity includes receiving the first communication from the first wireless device.

3. The method of claim **2** wherein receiving the first communication from the first wireless device includes receiving the first communication at the trusted system from the first wireless device over a wired connection between the first wireless device and the trusted system.

4. The method of claim **2** wherein receiving the first communication from the first wireless device includes receiving the first communication at the trusted system from the first wireless device over a wireless connection between the first wireless device and the trusted system.

5. The method of claim **2** wherein receiving a second communication that is associated with the second user identity includes receiving the second communication from the second wireless device.

6. The method of claim **5** wherein:

receiving the first communication from the first wireless device includes receiving the first communication at the trusted system from the first wireless device over a wired connection between the first wireless device and the trusted system; and

receiving the second communication from the second wireless device includes receiving the second communication at the trusted system from the second wireless device over a wired connection between the second wireless device and the trusted system.

7. The method of claim **5** wherein:

receiving the first communication from the first wireless device includes receiving the first communication at the

trusted system from the first wireless device over a wired connection between the first wireless device and the trusted system; and

receiving the second communication from the second wireless device includes receiving the second communication at the trusted system from the second wireless device over a wireless connection between the second wireless device and the trusted system.

8. The method of claim **1** wherein receiving a first communication that is associated with the first user identity includes receiving a request that the first wireless network configuration information be communicated to the first wireless device.

9. The method of claim **8** wherein receiving a second communication that is associated with the second user identity includes receiving a request that the second wireless network configuration information be communicated to the second wireless device.

10. The method of claim **1** wherein:

receiving a first communication that is associated with the first user identity includes receiving a first communication that includes an indication that the first communication is associated with the first user identity; and

determining that the first user identity is associated with the first communication includes determining that the first user identity is associated with the first communication based on the first communication including the indication that the first communication is associated with the first user identity.

11. The method of claim **10** wherein:

receiving a second communication that is associated with the second user identity includes receiving a second communication that includes an indication that the second communication is associated with the second user identity; and

determining that the second user identity is associated with the second communication includes determining that the second user identity is associated with the second communication based on the second communication including the indication that the second communication is associated with the second user identity.

12. The method of claim **1** further comprising:

in response to receiving the first communication, prompting the first user identity for authentication information;

receiving authentication information from the first user identity;

verifying the received authentication information; and

communicating the first wireless network configuration information to the first wireless device only after successfully verifying the received authentication information, wherein determining that the first user identity is associated with the first communication includes determining that the first user identity is associated with the first communication based on the received authentication information.

13. The method of claim **12** further comprising:

in response to receiving the second communication, prompting the second user identity for authentication information;

receiving authentication information from the second user identity;

verifying the received authentication information; and

communicating the second wireless network configuration information to the second wireless device only after successfully verifying the received authentication information, wherein determining that the second user identity is associated with the second communication includes determining that the second user identity is associated with the second communication based on the received authentication information.

14. The method of claim **1** wherein the first wireless network configuration information includes a connectivity parameter such that communicating the first wireless network configuration information to the first wireless device includes communicating the connectivity parameter to the first wireless device.

15. The method of claim **14** wherein the second wireless network configuration information includes a connectivity parameter such that communicating the second wireless network configuration information to the second wireless device includes communicating the connectivity parameter to the second wireless device.

16. The method of claim **1** wherein storing the collection of wireless network configuration information on the trusted system includes storing the collection of wireless network configuration information on a trusted system that is physically distinct from both the first wireless device and the second wireless device.

17. The method of claim **1** wherein storing the collection of wireless network configuration information on the trusted system includes storing the collection of wireless network configuration information on a system provided by an Internet service provider or a system provided by an Internet access provider.

18. The method of claim **1** wherein identifying the first wireless network configuration information based on determining that the first user identity is associated with the first communication and by leveraging the accessed association between the first user identity and the first wireless network configuration information includes:

determining that other wireless network configuration information stored on the trusted system is associated with the first user identity;

enabling the first user identity to select one of the first wireless network configuration information and the other wireless network configuration information as wireless network configuration information to be communicated to the first wireless device; and

receiving an indication of a selection by the first user identity of the first wireless network configuration information as the wireless network configuration information to be communicated to the first wireless device.

19. The method of claim **18** wherein identifying the second wireless network configuration information based on determining that the second user identity is associated with the second communication and by leveraging the accessed association between the second user identity and the second wireless network configuration information includes:

determining that other wireless network configuration information stored on the trusted system is associated with the second user identity;

enabling the second user identity to select one of the second wireless network configuration information and the other wireless network configuration information as wireless network configuration information to be communicated to the second wireless device; and

receiving an indication of a selection by the second user identity of the second wireless network configuration information as the wireless network configuration information to be communicated to the second wireless device.

20. A non-transitory computer-readable storage medium storing a computer program, the computer program including instructions that cause a computing device to:

store, on the computing device, a collection of wireless network configuration information for different wireless networks, the collection of wireless network configuration information including:

first wireless network configuration information that corresponds to a first wireless network and that is useful for configuring wireless devices to enable the wireless devices to communicate wirelessly over the first wireless network; and

second wireless network configuration information that corresponds to a second wireless network and that is useful for configuring the wireless devices to enable the wireless devices to communicate wirelessly over the second wireless network;

store, on the computing device, an association between a first user identity and the first wireless network configuration information;

store, on the computing device, an association between a second user identity and the second wireless network configuration information;

receive a first communication that is associated with the user identity;

access, in response to receipt of the first communication and from storage on the computing device, associations between wireless network configuration information and user identities, the accessed associations between wireless network configuration information and user identities including the stored association between the first user identity and the first wireless network configuration information and the stored association between the second user identity and the second wireless network configuration information;

determine that the first user identity is associated with the first communication;

based on determining that the first user identity is associated with the first communication and by leveraging the accessed association between the first user identity and the first wireless network configuration information, identify and communicate the first wireless network configuration information to a first wireless device;

receive a second communication that is associated with the second user identity;

access, in response to receipt of the second communication and from storage on the computing device, associations between wireless network configuration information and user identities, the accessed associations between wireless network configuration information and user identities including the stored association between the first user identity and the first wireless network configuration information and the stored association between the second user identity and the second wireless network configuration information;

determine that the second user identity is associated with the second communication; and

based on determining that the second user identity is associated with the second communication and by leveraging the accessed association between the second user identity and the second wireless network configuration information, identify and communicate the second wireless network configuration information to a second wireless device.

21. The non-transitory computer-readable storage medium of claim **20** wherein the instructions that cause the computing device to receive the first communication includes instructions that cause the computing device to receive a request that the first wireless network configuration information be communicated to the first wireless device.

22. The non-transitory computer-readable storage medium of claim **20** wherein the instructions that cause the computing device to receive the first communication includes instructions that cause the computing device to receive an indication that the first communication is associated with the first user identity; and

wherein the instructions that cause the computing device to determine that the first user identity is associated with the first communication includes instructions that determine that the first user identity is associated with the first communication based on the indication that the first communication is associated with the first user identity.

23. The non-transitory computer-readable storage medium of claim **20**, wherein the computer program includes further instructions that cause the computing device to:

in response to receiving the first communication, prompt the first user identity for authentication information;

receive authentication information from the first user identity;

verify the received authentication information; and

communicate the first wireless network configuration information to the first wireless device after verification of the received authentication information, wherein the determination that the first user identity is associated with the first communication is based on the received authentication information.

24. The non-transitory computer-readable storage medium of claim **20**, wherein the computer program includes further instructions that cause the computing device to:

determine that other stored wireless network configuration information is associated with the first user identity; and

receive an indication of a selection of the first wireless network configuration information or of the other wireless network configuration as the wireless network configuration information to be communicated to the first wireless device.

25. A system for communicating wireless configuration information for a wireless network to a wireless device, the system comprising:

at least one processing element; and

a data storage system storing:

a collection of wireless network configuration information for different wireless networks, the collection of wireless network configuration information including:

first wireless network configuration information that corresponds to a first wireless network and that is useful for configuring wireless devices to enable the wireless devices to communicate wirelessly over the first wireless network; and

second wireless network configuration information that corresponds to a second wireless network and that is useful for configuring the wireless devices to enable the wireless devices to communicate wirelessly over the second wireless network;

an association between a first user identity and the first wireless network configuration information; and

an association between a second user identity and the second wireless network configuration information; and

instructions that cause the at least one processing element to:

receive a first communication that is associated with the first user identity;

access, in response to receipt of the first communication and from the data storage system, associations between wireless network configuration informa-

tion and user identities, the accessed associations between wireless network configuration information and user identities including the stored association between the first user identity and the first wireless network configuration information and the stored association between the second user identity and the second wireless network configuration information;

determine that the first user identity is associated with the first communication;

based on determining that the first user identity is associated with the first communication and by leveraging the accessed association between the first user identity and the first wireless network configuration information, identify and communicate the first wireless network configuration information to a first wireless device;

receive a second communication that is associated with the second user identity;

access, in response to receipt of the second communication and from the data storage system, associations between wireless network configuration information and user identities, the accessed associations between wireless network configuration information and user identities including the stored association between the first user identity and the first wireless network configuration information and the stored association between the second user identity and the second wireless network configuration information;

determine that the second user identity is associated with the second communication; and

based on determining that the second user identity is associated with the second communication and by leveraging the accessed association between the second user identity and the second wireless network configuration information, identify and communicate the second wireless network configuration information to a second wireless device.

26. A system for communicating wireless configuration information for a wireless network to a wireless device, comprising:

means for storing data, the data including:

a collection of wireless network configuration information for different wireless networks, the collection of wireless network configuration information including:

first wireless network configuration information that corresponds to a first wireless network and that is useful for configuring wireless devices to enable the wireless devices to communicate wirelessly over the first wireless network; and

second wireless network configuration information that corresponds to a second wireless network and that is useful for configuring the wireless devices to enable the wireless devices to communicate wirelessly over the second wireless network;

an association between a first user identity and the first wireless network configuration information; and

an association between a second user identity and the second wireless network configuration information;

means for receiving a first communication that is associated with the first user identity;

means for accessing, in response to receipt of the first communication and from the means for storing data, associations between wireless network configuration information and user identities, the accessed associations between wireless network configuration information and user identities including the stored association between the first user identity and the first wireless network configuration information and the stored association between the second user identity and the second wireless network configuration information;

means for determining that the first user identity is associated with the first communication;

means for identifying and communicating the first wireless network configuration information to a first wireless device based on a determination that the first user identity is associated with the first communication and by leveraging the accessed association between the first user identity and the first wireless network configuration information;

means for receiving a second communication that is associated with the second user identity;

means for accessing, in response to receipt of the second communication and from the data storage system, associations between wireless network configuration information and user identities, the accessed associations between wireless network configuration information and user identities including the stored association between the first user identity and the first wireless network configuration information and the stored association between the second user identity and the second wireless network configuration information;

means for determining that the second user identity is associated with the second communication; and

means for identifying and communicating the second wireless network configuration information to a second wireless device based on a determination that the second user identity is associated with the second communication and by leveraging the accessed association between the second user identity and the second wireless network configuration information.

27. The system of claim **26**, further comprising:

means for determining that another stored wireless network configuration information is associated with the first user identity; and

means for receiving an indication of whether the first wireless network configuration information or the other wireless network configuration is to be communicated to the first wireless device.

* * * * *

UNITED STATES PATENT AND TRADEMARK OFFICE

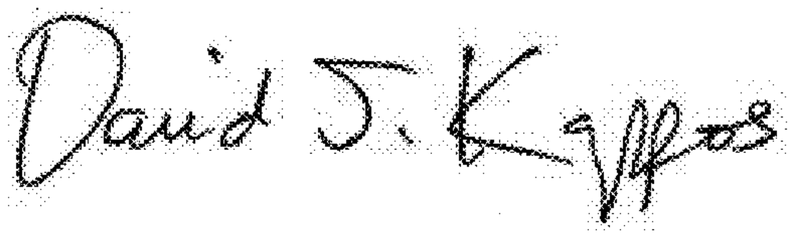
CERTIFICATE OF CORRECTION

PATENT NO. : 7,916,707 B2
APPLICATION NO. : 12/050075
DATED : March 29, 2011
INVENTOR(S) : Fontaine

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

Page 2, item (56), under "Other Publications", in Column 1, Line 6, delete "PPv4" and insert -- IPv4 --.

Signed and Sealed this
Second Day of August, 2011



David J. Kappos
Director of the United States Patent and Trademark Office